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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,761	04/09/2004	Li-Shu Chen	1215-0509P(000224-078 D1)	8830
2292	7590	12/13/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			ROMAN, ANGEL	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/820,761	CHEN ET AL.	
	Examiner	Art Unit	
	Angel Roman	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/03/04; 10/04/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: The following limitations must be provided with appropriate antecedent basis; in line 4 "respective locations", in line 6 "the undersurface", in line 10, "the periphery" and in line 12 "the bottom". Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Orcutt et al. U.S. Patent 6,452,238 B1.

Orcutt et al. disclose a method of making a wafer scale package for electronic circuits, comprising the steps of: placing electronic circuits each having at least one electronic device 512 and associated signal lines at locations on a silicon base wafer 511; forming cavities 515 on the undersurface of a silicon cover wafer 524 at the

locations to accommodate said respective electronic devices 512, when said wafers are joined (see figure 5); forming and metallizing vias 518 in said cover wafer 524 (see figure 4a); metallizing a periphery of each said location on said base and cover wafers; metallizing an electric contact between a bottom of a said metallized via and said signal lines (see figure 6a); joining said base and cover wafers at predetermined pressure, temperature and time conditions to form a peripheral hermetic seal around each said location and a via hermetic seal around each said bottom of a said via; and dicing said joined and sealed wafers along said locations to provide individual die packages (see column 6, lines 59-65). The periphery of the locations in the cover and base wafers are metallized with a plurality of metal layers (544, 630, 626) including indium (see column 6, lines 46-49); a thin film metal layer 630 compatible with solders and a titanium layer 626 (see column 6, lines 19-29).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orcutt et al. U.S. Patent 6,452,238 B1 in view of Ohara et al. U.S. Patent 5,668,033 A.

Orcutt et al. is applied as above but lacks anticipation on applying a titanium metal layer to a periphery of the locations on the cap wafer; disclosing a bonding pressure around 30-80 psi, a bonding temperature of about 120-200 degrees Celsius and a bonding time of about 1-3 hours.

With respect to applying a titanium metal layer to a periphery of the locations on the base wafer, Ohara et al. discloses applying a titanium layer to a periphery of a cap wafer (See figure 13); therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to use a titanium layer in the cap

wafer disclosed in the primary reference of Orcutt et al. as disclosed in Ohara et al. in order to improve adhesion between the metal layers (see Ohara, column 8, lines 53-61).

Regarding selecting a pressure parameter of about 30-80 psi, a temperature parameter of about 120-200 degrees Celsius and time parameter of about 1-3 hours for a seal bonding process in the primary reference of Orcutt et al., selecting the process parameters disclosed above in the primary reference of Orcutt et al. is only considered to be routine optimization of the process disclosed in Orcutt et al. that a person having ordinary skills in the art at the time the invention was made would have find obvious to obtain by routine experimentation since Orcutt et al. already suggest using pressure, temperature and time for the seal bonding process.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ding et al., Lee et al., Gan et al., Salaville, Kang et al., Gooch, Shibahara et al., and Silverbrook disclose methods for making wafer scale packages having sealed semiconductor devices.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (571) 272-1681. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

Art Unit: 2812

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR
December 8, 2004


John F. Niebling
Supervisory Patent Examiner
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